

**Serial No. 10/525,631
Atty. Doc. No. 2002P09821WOUS**

Amendments To The Claims:

Please amend the claims as shown.

1 – 8 (canceled)

9. (currently amended) An electrically controlled optical add-drop multiplexer, comprising:

- a multiplexer;
- a demultiplexer;
- an optical filter;
- a micro-electrical-mechanical system; and
- an optical amplifier,

wherein the multiplexer, the demultiplexer, the optical filter, the micro-electrical-mechanical system and the optical amplifier are formed within at least one of a plurality of optical layers ~~of a integrated within a multilayer printed circuit board, the multilayer printed~~ circuit board comprising ~~at least one a plurality of electrically insulating layers wherein at least two of the plurality of electrically insulating layers are separated by at least one of the plurality of optical layers~~, at least one electrically conductive conductor path on an upper surface of the ~~at least one of the plurality of electrically insulating layers to which an electro-optic device is electrically connected, the at least one of the plurality of optical layers beneath the at least one of the plurality of electrically insulating layers, a connecting opening formed within the at least one of the plurality of optical layers, an optical coupling element within the connecting opening whereby the electro-optic device is oriented above the optical coupling element so that an optical signal exiting the electro-optic device is redirected by the optical coupling element to an optical waveguide formed within the at least one of the plurality of optical layers, whereby the optical waveguide carries the optical signal to the electrically controlled optical add-drop multiplexer.~~

10. (previously presented) The add-drop multiplexer according to Claim 9, wherein a layer of the multilayer printed circuit board has both optical and electrical conductor paths.

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11. (previously presented) The add-drop multiplexer according to Claim 9, wherein the multilayer printed circuit board has organic and inorganic materials.

12. (previously presented) The add-drop multiplexer according to Claim 9, wherein the multilayer printed circuit board has organic or inorganic materials.

13. (previously presented) The add-drop multiplexer according to Claim 9, the optical conductor paths are made of glass and polymers.

14. (previously presented) The add-drop multiplexer according to Claim 9, the optical conductor paths are made of glass or polymers.

15. (previously presented) The add-drop multiplexer according to Claim 9, wherein the optical conductor paths are fashioned from an element from the group consisting of: glass, silicon oxide, silicon dioxide, and polymer.

16. (previously presented) The add-drop multiplexer according to Claim 9, wherein a plurality of optical conductor paths formed within the multilayer printed circuit board have three-dimensional optical structures such that two optical conductor paths arranged in different layers of the multilayer printed circuit board are optically connected to one another.

17. (previously presented) The add-drop multiplexer according to Claim 9, the optical conductor paths contain a doping.

18. (previously presented) The add-drop multiplexer according to Claim 9, wherein the add-drop multiplexer further comprises; an electro-optical device, an opto-electrical device, and an optical device.

19. (canceled)

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20. (new) The electrically controlled add-drop multiplexer of claim 9 further comprising:

the demultiplexer receiving a wavelength division multiplex signal and producing a first subsignal;

the micro-electrical-mechanical system comprising an add-drop device for receiving the first subsignal and generating a second subsignal; and

the multiplexer receiving the second subsignal.